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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/758,485
Filing Date: January 15, 2004
Appellant(s): ABDO ET AL.

Thomas W. Humphrey
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 01/14/2008 appealing from the Office action mailed 01/24/2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

This appeal involves claims 1 – 19.

Claims 1 – 19 were rejected.

No claims were objected.

No claims were allowed.

No claims were cancelled.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

NEW GROUND(S) OF REJECTION

The following new ground(s) of rejection have been applied to the appealed claims 17 – 19.

Claims 17 – 19 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,513,029 B1	AGRAWAL	8-2000

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

NEW GROUND(S) OF REJECTION

The following new ground(s) of rejection have been applied to the appealed claims 17 – 19. Claims 17 – 19 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 17 – 19 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 17 (which recites a “program comprising”), is directed to functional descriptive material per se.

Appellant should duly note that; both types of “descriptive material” are nonstatutory when claimed as descriptive material per se, 33 F.3d at 1360, 31 USPQ2d at 1759. When functional descriptive material is recorded on some computer-readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994).

Claims 18 and 19 fail to be limited to embodiments which fall within a statutory category. Particularly, the claims recite "the signal bearing media" (see also [0025] of the specification), which does not appear to be a process, machine, manufacture, or composition of matter. See, e.g., In re Nuitjen, Docket no. 2006-1371 (Fed. Cir. Sept. 20, 2007)(slip. op. at 18)("A transitory, propagating signal like Nuitjen's is not a process, machine, manufacture, or composition of matter.' … Thus, such a signal cannot be patentable subject matter.").

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 – 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 9, and 17 recite the limitation "the prior application". There is insufficient antecedent basis for this limitation in the claim. It is unclear to the examiner which prior application the claims refer to, or whether "the prior application" is before the "evaluating…" step.

Any claim not specifically addressed, above, is being rejected as incorporating the deficiencies of a claim upon which it depends.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1- 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Agrawal et al. (Agrawal hereinafter) (US Patent No. 6,513,029 B1, filed: August 1, 2000).

Regarding Claims 1, and 9, Agrawal discloses an apparatus for performing a query in a relational database system by operating upon a plurality of relations each comprising a plurality of tuples formed over a plurality of attributes, comprising:

a data storage device storing said relations (Col. 7, lines 3 – 10, a database, Agrawal), and

a processor evaluating join predicates in said query to determine whether a join involving a first relation and a second relation will be reductive of said first relation (Fig. 6, item 601, 602, and 603, Col. 15, lines 26 – 30 and 43 – 46; respectively, Agrawal[1]), identifying a join involving said first and second relations that will be reductive of said first relation (Col. 15, lines 29 – 31, V12, Agrawal), and performing said query by the

[1] Wherein V1 and V2 correspond to the first relation and second relation claimed; and wherein the step of eliminating corresponds to the step of reducing as claimed.

prior application of a look-ahead predicate based upon the second relation in the join (Fig. 6, item 603, and 601, Col. 15, lines 51 – 55 and 58 – 59, Agrawal[2]).

Regarding Claims 2, and 10, Agrawal discloses an apparatus wherein said processor determines whether a relation involved in the join is subject to a selection criterion (Fig. 9, items 902, and 903, Col. 16, lines 56 – 62, Agrawal[3]), and evaluates whether that selection criterion effects a join reduction (Fig. 9, item 904, and 905, Col. 17, lines 11 – 16, Agrawal).

Regarding Claims 3, and 11, Agrawal discloses an apparatus wherein an amount of join reduction effected by a selection criterion is determined by identifying whether the number of rows in the join result will be smaller than the number of rows in the first relation (Fig. 9, item 904, Col. 17, lines 5 – 10, Agrawal).

Regarding Claims 4, and 12, Agrawal discloses an apparatus wherein, upon identifying a join reduction involving a first and a second relation (Fig. 9, item 904, Col. 17, lines 7 – 10, Agrawal[4]), and a selection criterion on the second relation, the potential

[2] Wherein the step of estimating the number of rows through the optimizer corresponds to the step of using a look-ahead predicate as claimed.
[3] Wherein the selection conditions correspond to the selection criteria claimed.
[4] Wherein the "if" statement that includes the step of obtaining the Min size corresponds to the step of identifying a join reduction as claimed.

benefit of that join reduction is assessed (Fig. 9, item 905, Col. 17, lines 9 – 10 and 22 – 26, Agrawal[5]).

Regarding Claims 5, and 13, Agrawal discloses an apparatus wherein said processor evaluates the computational expense of generating a look-ahead predicate comprising the tuples of the second relation matching the selection criterion (Col. 17, lines 52 – 55, cost – based pruning, Agrawal), and comparing said expense to computational savings that result from the join reduction (Col. 18, lines 29 – 32 and 36 – 42, Agrawal).

Regarding Claims 6, and 14, Agrawal discloses an apparatus wherein, upon identifying a beneficial look-ahead predicate (Col. 17, lines 22 – 26, Agrawal), processing the query by forming and utilizing the look-ahead predicate as a selection criterion on the second relations (Col. 17, lines 27 – 28, Agrawal).

Regarding Claims 7, and 15, Agrawal discloses an apparatus wherein said processor identifies the most beneficial look-ahead predicate among all potential joins of relations in said query, through iterative analysis of all possible joins (Fig. 5, Col. 15, lines 3 – 7, Agrawal).

[5] Wherein obtaining an estimate of the view size form the query optimizer corresponds to assessing the potential benefit as claimed.

Regarding Claim 8, and 16, Agrawal discloses an apparatus wherein said processor iteratively analyzes all possible joins of the remaining relations (Col. 15, lines 41 – 43,by recursively getting the parents, Agrawal) and the look-ahead predicate to locate further beneficial look-ahead predicates (Col. 15, lines 51 – 54 and 58 – 59, estimate the number of rows … from the query optimizer, Agrawal).

Regarding Claim 17, Agrawal discloses a program product comprising:

a relational database comprising one or more relations, each relation comprising one or more tuples on one or more attributes (Col.7, lines 3 – 10, a database, Agrawal), and

relational database system adapted to perform a query on said relational database by evaluating join predicates in said query to determine whether a join involving a first relation and a second relation will be reductive of said first relation (Fig. 6, item 601, 602, and 603, Col. 15, lines 26 – 30 and 43 – 46; respectively, Agrawal[6]), identifying a join involving said first and second relations that will be reductive of said first relation (Col. 15, lines 29 – 31, V12, Agrawal), and perform said query by the prior application of a look-ahead predicate based upon the second relation in the join (Fig. 6, item 603, and 601, Col. 15, lines 51 – 55 and 58 – 59, Agrawal[7]), and

signal bearing media bearing the relational database and the relational database system (Col.6, lines 10 – 15, Agrawal).

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[6] Wherein V1 and V2 correspond to the first relation and second relation claimed; and wherein the step of eliminating corresponds to the step of reducing as claimed.

[7] Wherein the step of estimating the number of rows through the optimizer corresponds to the step of using a look-ahead predicate as claimed.

Regarding Claim 18, Agrawal discloses a program product wherein the signal bearing media comprises transmission media (Col. 6, lines 10 – 15, Agrawal).

Regarding Claim 19, Agrawal discloses a program product wherein the signal bearing media comprises recordable media (Col. 5, lines 24 – 30, Agrawal).

(10) Response to Argument

Claims 1 – 19 are indefinite under 35 U.S.C. 112

Appellant argues that; "the Examiner is misreading the claim language; 'the prior application' is not referring to any other language in the claim, but rather it is a description of the manner of performance of the query- the query is performed by the prior, i.e. initial, application of a predicate that is based on the second relation in the join".

Examiner respectfully disagrees. As stated in Final Office Action dated 01/09/2007, there is insufficient antecedent basis for the limitation: "**the prior application of** a look-ahead predicate" in the claim. It is unclear to the examiner which prior application the claims refer to, or whether "the prior application" is before the "evaluating…" step. Therefore, this limitation renders the claim indefinite.

Claims 1 – 19 are anticipated by Agrawal et al. (U.S. Patent 6,513,029)

Appellant argues that; "there is nothing in Agrawal that relates to 'performing a query' by 'evaluating join predicates in [the] query', since at the time that Agrawal is identifying 'materialized views' there is no query, only the hypothetical possibility of a future query for which a 'materialized view' may be useful. The claim language, directed to actually 'performing a query' and steps taken during performance of the query, thus is not and could not be anticipated by language regarding creation of an index or 'materialized views' when there is not yet a query to be processed."

Examiner respectfully disagrees. First, contrary to appellant's arguments, Agrawal clearly discloses that at the time of the step of identifying the materialized view there is a query (see for example; Fig. 2, items 215, 220, 225, Col. 6, lines 60 – 67, "One way to obtain such **a workload is to use logging capabilities of modem database systems to capture a trace of queries**… A syntactic structure selection module 220 or program receives the workload 215 as input. Given workload 215, **syntactically relevant indexes, materialized views…. are generated**..."; note that the workload 215 occurs before the materialized view "220" and "235"; Col. 7, 1 – 10, "This can be illustrated by the following example which identifies data to be retrieved from sales table in a database. **Given a query Q**: **Select Sum (Sales), From Sales_Table Where City='Seattle'**. **For query Q,** the following materialized views are syntactically relevant: V1: Select Sum (Sales) From Sales_Table Where City ='Seattle', Sum)…"; and also see the following example which shows more than one query, shows 1000

queries: Col. 9, lines 41 – 55, "**Consider a workload of 1000 queries of the form: Select1_returnflag, 1_linestatus, Sum (1_quantity) From lineitem Where 1_shipdate between <Date1> and <Date2> Group by 1_returnflag, 1_linestatus**. ...the following materialized view that can service all 1000 queries...", Agrawal). Since the materialized view is identified/generated **based on a given query**, there is a query at the time the materialized view is identified. Additionally, it is well known in the art of database management systems that a materialized view is a database object that contains the results of a query (also mentioned col. 2, 21 – 23, Agrawal). Second, as discussed in the Final Office Action dated 01/09/2007, Agrawal does disclose: **evaluating join predicates in [the] query' (**Fig. 6, item 601: "Let V1 and V2 be a pair of materialized views that reference the same tables and have the same where clause", 602: "Let V be a view obtained by taking the union of the projection columns of V1 and V2 and union of the group by columns of V1 and V2", and 603, Col. 15, lines 26 – 35, 43-46, and 50-55; respectively, Wherein the step of generating a "merged materialized view" V and further ensuring the similarity, eliminating "much less useful" merged materialized views, and estimating the size, corresponds to the step of evaluating the join predicates in [the] query as claimed. Note that since V is the union of V1 and V2, then it corresponds to the join predicates as claimed; Agrawal; and also see: Col. 16, lines 49 – 55, "For simplicity, **the algorithm for SPJ (select projection join) views** with grouping and aggregation, where the selection conditions are conjunctions of simple predicates…", Agrawal). Third, Agrawal further discloses: "performing said query by the prior application…" (See for example, Col. 17, lines 50 – 55, "…merged

views generated by this algorithm are ensured to be actually useful **in answering queries** in the workload, by performing cost-based pruning using the query optimizer…"; Col. 21, lines 36 – 41 "…Given two parent materialized views M1 and M2…indexes on merged materialized view M12 are proposed…", and 60 – 67, "…The selection of which to consider first is arbitrary in one embodiment. Other embodiments may give precedence to the parent view that is used by the optimizer **to answer the query** with higher cumulative cost, or to give precedence to the parent view that has higher benefit (i.e. reduction in cost) for the queries in which it is used by the optimizer…," Agrawal). From these passages, it is clear that Agrawal teaches performing a query (according to Agrawal: answering the query) by the evaluating step (see materialized algorithm for generating merged materialized views discussed in this Examiner's Answer above).

Appellant argues that; "There is no discussion in the Agrawal text cited by the Examiner of the use of a look-ahead predicate."

Examiner respectfully disagrees. First, as stated in the Final Office Action dated 01/09/2007 (also included in this Examiner's Answer above), the term "**the prior application of** a look-ahead predicate" renders the claim indefinite since there is insufficient antecedent basis in the claim. It is unclear which "prior application" the claim refers to, or whether "the prior application of a look ahead" is before the "evaluating…" step (see also 112 rejections above). Second, Agrawal does teach a look-ahead predicate (Col. 8, lines 11 – 25, "account the **expected impact of the**

proposed configurations on the total cost of the queries in the workload, computed as the sum of the cost of queries in the workload as provided by **cost estimation** module 240…", and "…The module simulates the presence of indexes and materialized views that do not exist (**referred to as "what-if" materialized views and indexes**) to a query optimizer which is common in database servers. The optimizer also computes the cost of Q when given a query Q…", Fig. 6, item 603, and 601, Col. 15, lines 51 – 55 and 58 – 59, Col. 9, lines 30 – 35, "and hence the work saved **by pre-computing the portion** of the queries involving nation, and region is insignificant compared to pre-computing the portion of the query involving lineitem, and orders…"; Agrawal). Examiner notes that the specification of appellant's disclosure defines the term "look-ahead predicate" as a selection based on the advance processing (See [0009] of the specification). Since Agrawal teaches estimating, simulating including "what if" materialized views, and further **pre-computing** portions of the query, then Agrawal teaches the use of a look-ahead predicate (advance procession) as claimed.

Appellant argues that; "evaluating whether that selection criterion effects a join reduction."

Examiner respectfully disagrees. Agrawal does disclose: evaluating whether that selection criterion effects a join reduction (Fig. 9, item 904, and 905, Col. 17, lines 11 – 16, Col. 15, lines 43 – 46, "…The goal of 603 and 703 in the MergeViewPair algorithms is to eliminate merged materialized views from being generated that are likely to be "much less useful" than both its parents…"; wherein 603 and 703 show the selection

criteria "IF… RETURN NULL, RETURN V", and wherein the step of eliminating "much less useful" merged materialized views corresponds to the step of effecting a join reduction as claimed.

In response to appellant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which appellant relies (i.e.,"…reductive of a relation **so that a query can be** performed… "determination of when one should be used", "**creating** a look-ahead predicate", "**a decision process** in query processing which determines whether a join is reductive and **if so, applies a look ahead** predicate based upon a relation in the join", and "effects a join rejection") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

This examiner's answer contains a new ground of rejection set forth in section **(9)** above. Accordingly, appellant must within **TWO MONTHS** from the date of this answer

exercise one of the following two options to avoid *sua sponte* **dismissal of the appeal** as to the claims subject to the new ground of rejection:

(1) **Reopen prosecution.** Request that prosecution be reopened before the primary examiner by filing a reply under 37 CFR 1.111 with or without amendment, affidavit or other evidence. Any amendment, affidavit or other evidence must be relevant to the new grounds of rejection. A request that complies with 37 CFR 41.39(b)(1) will be entered and considered. Any request that prosecution be reopened will be treated as a request to withdraw the appeal.

(2) **Maintain appeal.** Request that the appeal be maintained by filing a reply brief as set forth in 37 CFR 41.41. Such a reply brief must address each new ground of rejection as set forth in 37 CFR 41.37(c)(1)(vii) and should be in compliance with the other requirements of 37 CFR 41.37(c). If a reply brief filed pursuant to 37 CFR 41.39(b)(2) is accompanied by any amendment, affidavit or other evidence, it shall be treated as a request that prosecution be reopened before the primary examiner under 37 CFR 41.39(b)(1).

Extensions of time under 37 CFR 1.136(a) are not applicable to the TWO MONTH time period set forth above. See 37 CFR 1.136(b) for extensions of time to

Examiner, Art Unit 2162reply for patent applications and 37 CFR 1.550(c) for extensions of time to reply for ex parte reexamination proceedings.

Respectfully submitted,

/Giovanna Colan/

Giovanna B. Colan
Examiner
Art Unit 2162

A Technology Center Director or designee must personally approve the new ground(s) of rejection set forth in section (9) above by signing below:

Conferees:

/John Breene/

Supervisory Patent Examiner, Art Unit 2162

Don K. Wong
Supervisory of Patent Examiner
Art Unit 2163

/don wong/
Supervisory Patent Examiner, Art Unit 2163

An appeal conference was held on 14 March 2008, and it was agreed to proceed to the board of appeals.